

## Pneumoconioses: Clinico-radiological Study and the Role of HRCT for their Early Diagnosis



### Healthcare

**Keywords:** Pneumoconioses, PRD, Collagen, Non-collagen, disease, etc.

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### Abstract

Pneumoconioses or Professional Respiratory Diseases (PRD), are a large and important group of diseases as health aspects, as well as socio - economic in that they have high frequency and are developed with chronic course (5,6.). They are caused by prolonged contact for many years with powder some of the employees: that may be the size, origin and different forms and give harmful actions on organs and systems of the human body mainly on the respiratory apparatus. These diseases causes different clinical and serious complications not only in respiratory apparatus but in all our body, providing more suffering chronic harmful consequences to loss of life. The Pneumoconioses cause numerous and serious injuries in respiratory apparatus and by aggressive action caused by powders that are formed in different working environments (7,15), they are categorized in two groups: 1. Collagen - forming, which include silicosis, asbestosis and beriliosis (5,14) 2. Non - collagen forming which are part antrakosis, siderosis, aluminosis, bisinosis, talkosis, bagasosis, etc (5,7,12). The conditions of our country where all work are associated with ground water mining and extraction of minerals such as copper, iron, nickel, chrome, coal, stone etc., workers fall in contact with powders free of silicium dioxide (SiO<sub>2</sub> free) confirmed that the disease.

### Aim of the study

The main goal in our study is epidemiological, to find the extent of these diseases in different areas of our country. Also, we noted that the purpose of comparing different methods of clinical-imaging diagnosis.

Taking the relevant data we had the purpose to correlate the preclinical symptoms that we found with radiological opacitetet related fields such as ro-graph, and so on HRCT imaging pulmonary scanner.

### Methods and study materials

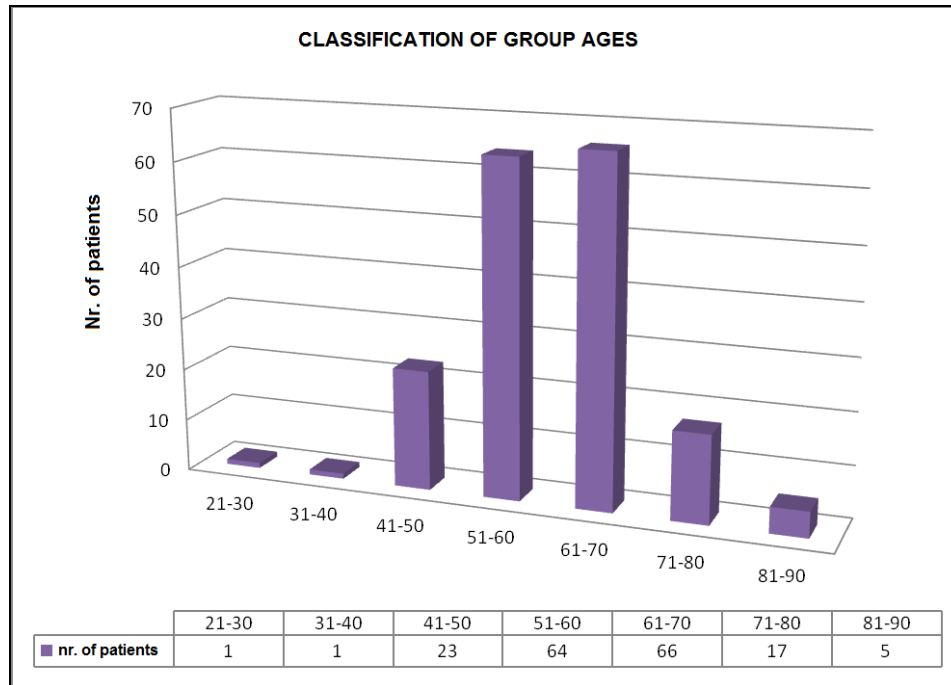
The study methodology is based on the formation of a questionnaire which created the possibility of the benefit of subjective symptomatology, the main objective signs as well as data imaging examinations particularly those ro-Graphic pulmonary and H.R.CT scanner as well as also in other relevant diagnostic examinations.

As study material have taken ill with pneumokoniozis 177 or PDR who are kept in pursuit and consultation over a period of about 20 years by occupational diseases cabinet also conducting complementary examinations for bacilli chocus in sputum and other bacterial pathogens flora.

As well as materials are used: clinical records ,pathology data for professional consultancies questionnaire completed by us, ro-graph pulmonary of patients that are examine H.R.CT-pulmonary that were made ,respiratory functional tests ,other blood tests, evidence of collagen, ECG respective endoscopy performed in the hospital "Shefqet Ndroqi"

## The study results

Concrete results are reflected as follows through appropriate graphics and comments by the main data that have emerged from our study.

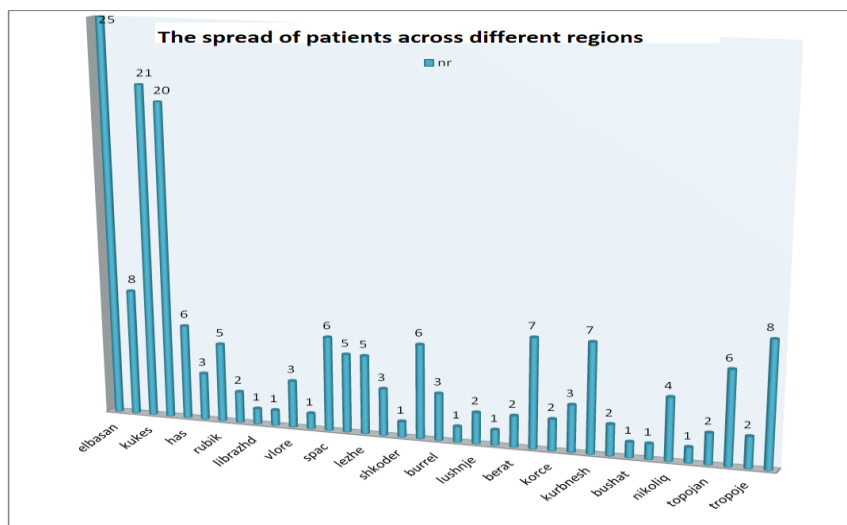


**Graph 1. Distribution by age group**

According to this graph shows that we have an allocation of our patients by age group starting from 20 years old and continue until age 90. As seen from the chart, the number of large bow is in the age group from 41 years to 71 years age group.

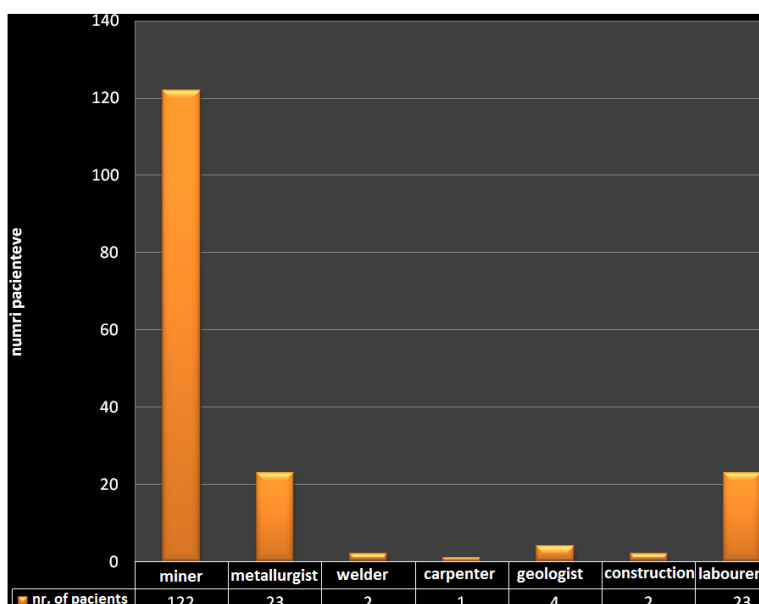
Separated by 10 years, note that in the age group 41-50 years are sick of pneumoconioses 23 patients, from age 51 to age 60 years are 64 people, aged 61 to 70 years old are the largest number of 66 patients with PRD: while over the age of 71 years are a total of 22 patients was positive growth .. age our patients that we few cases (5) is over 80 years old and this is dedicated Early diagnosis through screening and periodic medical visits before 1990 which have been very regular and quite productive for early detection as the diagnosis Pneumoconioses. Graph 2. Distribution of the patients according to their living place and regions.

Where the distribution of the ill persons in relation to their living areas is an epidemiological data with significant values because there is the moment where we have the highest illness. The first place is cover by MIRDITA REGION close to the places where the minings are situated especially in RRESHENI, KURBNESHI, SPACI and RUBIKU and after that comes KUKESI region with the minings of GJEGJAN, REXHEPAJ melting factory and ELBASANI region with the ferro metallurgy and metalurgy of steel.



**Graph 2. Findings of pneumokoniozas patients according to the Profession.**

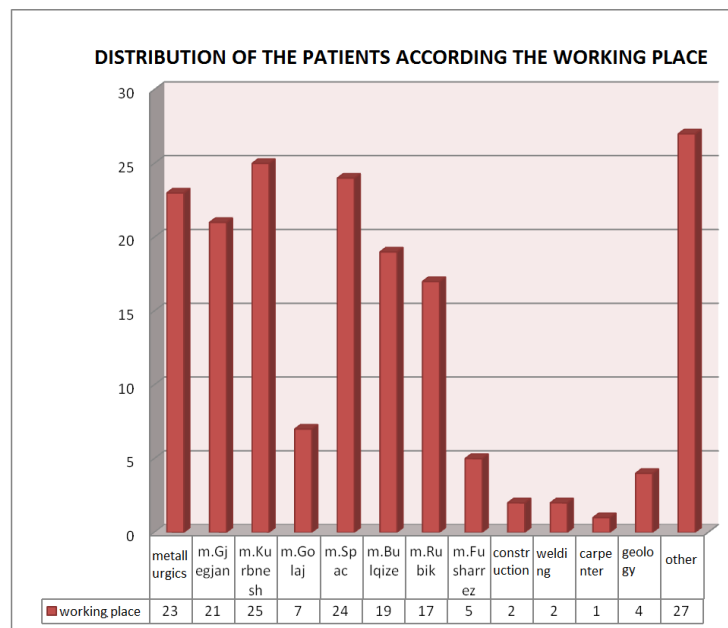
Our ill persons are of different professions and categories but divided to the age groups we notice that the first place is covered by the group of miners composed of 122 persons or approximately 70% of all the contingent taken for study; the second place is covered by the group of metallurgists mainly from ELBASAN composed of 23 persons or 13% and with the same number and the same percentage follows the group of the ENRICHMENTS FACTORIES covering 13% or 23 cases and at the end we have the workers of GEOLOGY etc.(2,6,7).



**Graph 3. Distribution of the Patients According to the Working Place.**

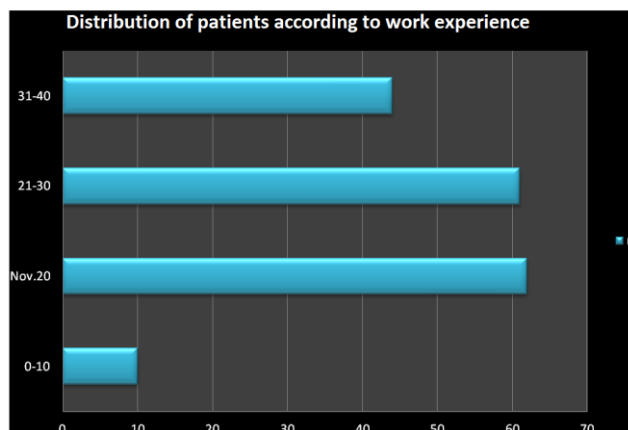
In the above Graphic we do differentiate the respective professions according the working places and the following professional profiles: in metallurgy we have 23 persons while in the enrichment factories there are 27 workers distributed in RRESHEN, KUKES, LAC etc. Also we have a large number of miners of 122 persons in some mines of KURBNESH, GJEGJAN, SPAC, RUBIK, GOLAJ, BULQIZE etc.

On the other hand, there is a small contingent of ill persons who have worked in construction objects, in GEOLOGY, different weldings and in carpentering one case. So it leads us to the fact that the places that have added content of dust are mainly the underground workings followed by metallurgy and the RESPECTIVE MINERAL ENRICHMENT FACTORIES.



**Graph 4. The distribution of ill persons according the work experience (probation)**

From the above graphic we notice that we have groups according to the different years of probation but what predominates mostly is the working probation from 11 – 20 years being exposed to the dusts of underground product or also in metallurgy and enrichment factories etc. This group composes 35% of the target contingent or equal to 62 cases. In the second place we have the group of the workers covering 21 – 30 years of working that covers 35% of the cases or 61 persons being in contact to different dusts of silicogenic or pneumocogenic nature. At the same time we notice that the persons who cover a bigger working probation ranging from 31 up to 40 working years compose 25% of the target contingent while under a probation work of less than 10 years in contact to the damaged dusts we have 10 cases of total.



**Graph 5.**

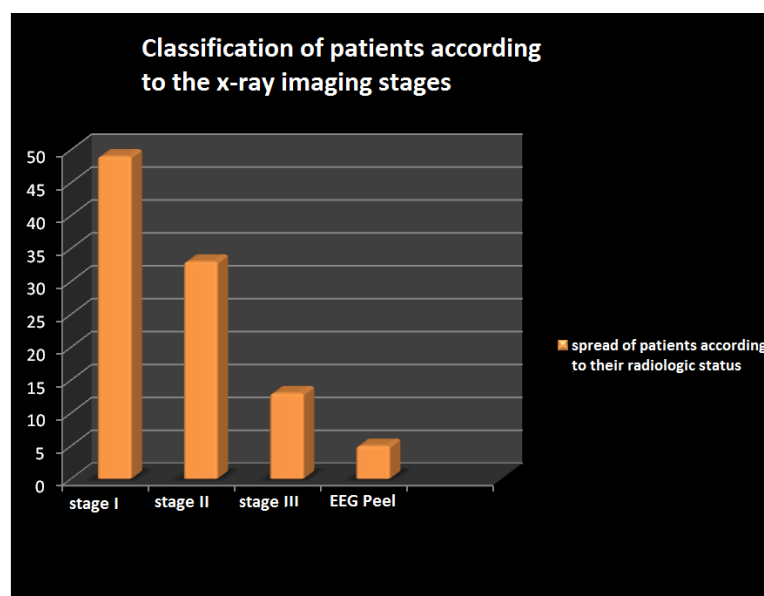
Among the preclinical signs which are present during the pneumoconitical illness we have differentiated: Difficulty in breathing or the so-called noea which is present in all our ill persons but it is differentiated into inspiratory NOEA being present in 64% of the cases and expiratory NOEA which covers only 3% of the cases and mix NOEA covering 33% of the cases. It is clearly seen that what predominates mostly is the difficulty in breathing during the inspiration and this is due to the formation of Fibrous Pulmonary as well as the creation of SILICOTIC NODULES.

SYMPTOM OF COUGH which is present in our ill persons and it is divided into dry cough covering 23% of the cases while the cough with sputum of different colors and quantities which is caused from the overlapping pulmonaries infections and due to the developing of respective pneumoconiozes and it is present in 77% of the target cases.

THE THIRD IMPORTANT SIGN is that of Chest pain which might be of the kind localized one and it is present in approximately in 80% of our cases and only in 20% they had a diffuse pain of the chest of the diffusive type.

Also there are other signs such as body weakness, loss of the body weight, precordial pain as well as of the joints which must enjoy the interest of the doctor during doing the respective illness history. The objective clinical signs generally are weak ones and mostly they do show out themselves in delay so the diagnostification need to be carried out with different methods where the first place belongs to imaging examination.

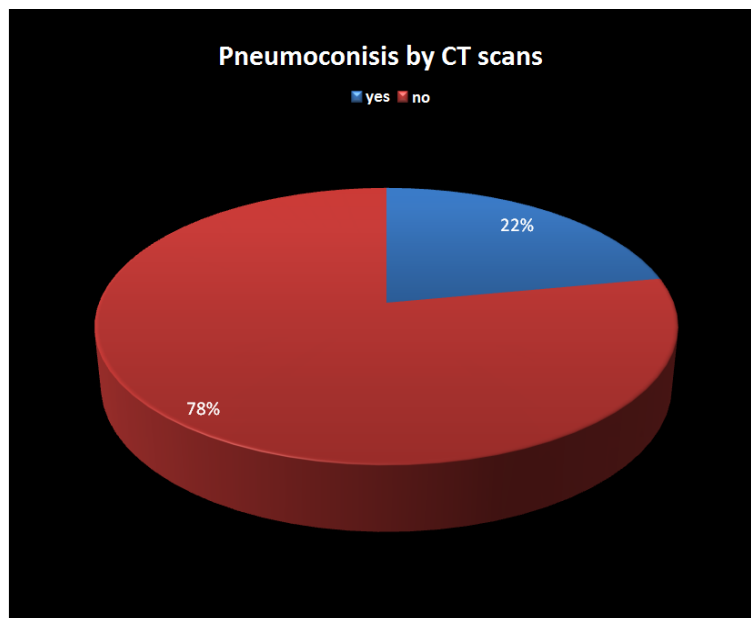
In our study we are focused mainly in roentgen(x-ray)graphic examination which is the most possible and accessible even to the most remote areas as well as in the medical regional services and which is realized by a low financial cost; Also we have been based in the modern imaging data obtained from the **HRCT – pulmonary scanner** which under the conditions of our country is mainly present at our University Health Center of Tirana “Mother Theresa” after 2000, where the first apparatus is installed near the HEALTH SERVICE OF PEDIATRIC RADIOLOGY supervised by Prof. KRENAR PREZA.



Graph 6. Patient classification according to the X-ray imaging stages.

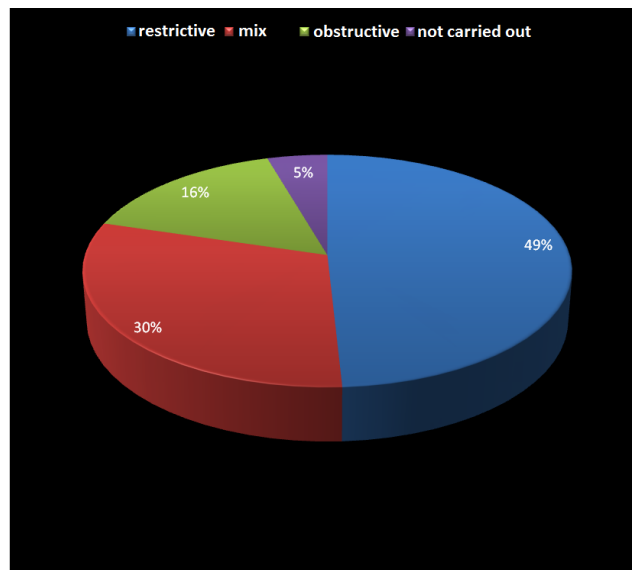
According to the X-ray classification of the pneumoconioses based on the GENEVA nomenclature it is divided into three stages as well as based on the “EGG PEEL” finding or in the differences in the node and pre – node areas that the imaging formations and the respective linfodules are similar to the egg peel.(11,13,16).

In the first stage, we have 58 patients which compose 335 of the total, in the second stage there are diagnosed 86 persons or 48% of the target cases and in the third stage are defined 23 patients or 13% of the cases and we have with the EGG PEEL syndrom only 10 cases or 6% of the total. According to this graphic it results that half of the ill persons are to be classified into the second stage of the pneumoconiasis which is considered as the most serious one or the most spread sort of the illness.



**Graph 7. Diagnostification of the pneumoconiosis by h.r.c.t. scanner.**

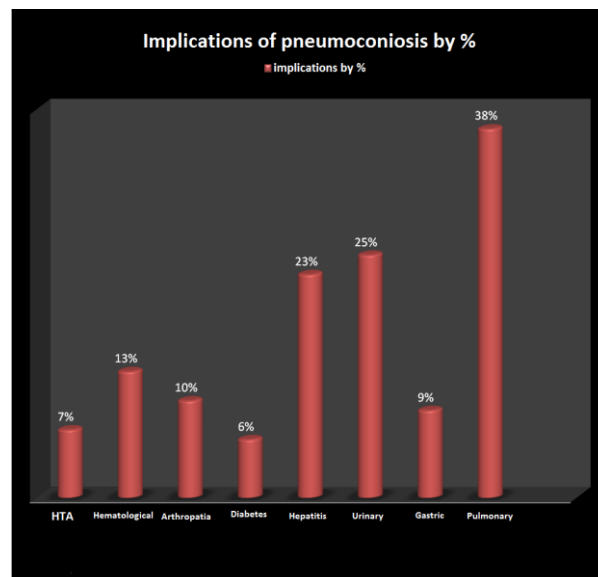
When we do have doubts of the diagnosis and in the cases when X-RAY is within the technical parameters and the film is a qualitative one or in the cases when the lungs tell for a chronic illness mainly under the influence of production dusts and especially when we want to realize a prior diagnostics in the early phases so before the first stage in the case when we will have only one pulmonary reticul of the professional aspect there it is the case to ask for the patients examination under the most sophisticated imaging method that is H.R. C.T. PULMONARY SCANNER(1,3,4.). In our study we have realized 44 cases or 22% of the total of our imaging examination of H.R.C.T. SCANNER and the results have been good ones and very qualitative that is why we recommend that method(9,10,13,16).



**Graph 8. The definition of the functional respiratory data.**

To the ill persons suffering from pneumoconiosis is the most advised one and one of the tests methods allowing us not only the ability of judging of the working ability of our ill persons in order to decide to the scale of the damage of our patients and if he is able to go on with his/her work and if not what is the group of professional invalidity he/she is going to be classified.

So this kind of examination is of a very high importance. So the functional ventilator attempts (respiratory) as one of the important professional pathologies in the practice now they are nothing but a routine. The results may be manyfold: RESTRICTIVE which in our study cover 49% of the patients or OBSTRUCTIVE which we do notice in 16% of the cases and MIXED in 30% of all the target contingent. (2,5,6,7).



**Graph 9. Implications of the Pneumoconiosis in Different Illnesses.**

As we know pneumoconiosis may cause touch of organs as well as the predispositions for a various illnesses which may be: INFECTIONS and pulmonary illnesses at 38% of the cases, urinary infections at 25% of the

cases, hepato-colecystitis at 23% of the cases, hematologic diseases mainly hypochromic anemia at 13% of the cases, chronic arthropathia at 10% of the cases, HTA of cardiac diseases as cor pulmonale at 7% of the cases etc. It is quite clear that pulmonary diseases mainly chronic bronchitis and T.B.C. are the most frequent ones. (2,6,14,15).

## Conclusions

1. PNEUMOCONIOSIS in Albanian are Professional Respiratory Diseases with a high frequency.
2. The most important place and the most frequently ones for those diseases are: MINES of the North-east area mainly those of copper and the copper and ferro metallurgy and on the other hand there is a great influence of the mining enrichment factories.
3. BASED ON PROFESSIONS we have noticed that the miners of our mines mainly those of copper etc. have the highest frequency of the professional morbidities and in the second place we have the workers of metallurgy etc.
4. The most DAMAGED persons are the ones of the age-group of 41 – 70 years old whom have been in the contact with industrial dusts for 11 – 20 working years mainly in the contact with the dust of free silicium dioxides.
5. For a fast diagnostification we have been helped by the imaging examination with **pulmonary x-ray** while in the last 12 years we used the **hrct-pulmonary** as well as the examination of the functional respiratory and the **sputum examination, fibrobronchoscope, proteinogramas**.
6. CONDUCTING HEALTH RECORDS, the realisation of the PERIODICAL MEDICAL EXAMINATIONS once a year for all the workers being in the contact with the productive dusts following by the respective IMAGING examinations are the most important duties for the PUBLIC HEALTH DIRECTORATES and HEALTH PUBLIC INSTITUTION (H.P.I.) .

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